Knewton Alta

Foundations of Mathematics | Table of Contents

        - Divide whole numbers using long division where there may be a remainder (20)
    - Applications of Dividing Whole Numbers
        - Translate word phrases involving division to math notation (20)
        - Divide whole numbers in applications (20)

Chapter 2: The Language of Algebra

2.1 Use the Language of Algebra

- Variables, Expressions, and Equations
    - Use variables and algebraic symbols (20)
    - Use variables and algebraic symbols to describe inequalities (20)
    - Identify expressions and equations (20)
- Exponents and Order of Operations
    - Use exponent notation and evaluate exponential expressions involving whole numbers (20)
    - Simplify expressions using the order of operations (20)

2.2 Evaluate, Simplify, and Translate Expressions

- Evaluating and Simplifying Expressions
    - Evaluate algebraic expressions (20)
    - Identify terms, coefficients, and like terms (20, 20, 20)
    - Simplify expressions by combining like terms (20)
- Translating Phrases to Algebraic Expressions
    - Translate word phrases to algebraic expressions (20)
    - Write word phrases from applications as algebraic expressions (20)

2.3 Solving Equations Using the Subtraction and Addition Properties of Equality

- The Subtraction and Addition Properties of Equality
    - Determine whether a number is a solution of an equation (20)
    - Model the Subtraction Property of Equality
    - Solve equations using the Subtraction Property of Equality (20)
    - Solve equations using the Addition Property of Equality (20)
- Translating Phrases to Algebraic Equations and Solving
    - Translate word phrases to algebraic equations (20)
    - Translate to an equation and solve (20)

2.4 Find Multiples and Factors

- Identify Multiples and Use Divisibility Tests
    - Identify multiples of numbers (20)
    - Use common divisibility tests (20)
- Find Factors and Identify Prime and Composite Numbers
    - Find all the factors of a number (20)
    - Identify prime and composite numbers (20)

2.5 Prime Factorization and the Least Common Multiple

- Prime Factorization and the Least Common Multiple
    - Find the prime factorization of a composite number using a factor tree
    - Find the prime factorization of a composite number using the ladder method (20)

- Find the least common multiple (LCM) of two numbers

Chapter 3: Integers

3.1 Introduction to Integers

- Integers on the Number Line and Opposites
  - Locate positive and negative numbers on the number line
  - Order positive and negative numbers
  - Find opposites (20)
  - Translate word phrases to expressions with integers
- Introduction to Absolute Value
  - Understand absolute value
  - Simplify expressions using the order of operations with absolute value

3.2 Add Integers

- Adding Integers and Variable Expressions Involving Integers
  - Model addition of integers
  - Add two integers (20)
  - Simplify expressions involving addition with integers (20)
  - Evaluate variable expressions involving addition with integers (20)
- Adding Integers in Applications
  - Translate word phrases involving addition to algebraic expressions (20)
  - Add integers in applications (20)

3.3 Subtract Integers

- Subtracting Integers and Variable Expressions Involving Integers
  - Model subtraction of integers
  - Subtract two integers (20)
  - Simplify expressions involving subtraction with integers (20)
  - Evaluate variable expressions involving subtraction with integers (20)
- Subtracting Integers in Applications
  - Translate word phrases involving subtraction to algebraic expressions (20)
  - Subtract integers in applications (20)

3.4 Multiply and Divide Integers

- Multiplying and Dividing Integers and Variable Expressions with Integers
  - Multiply two integers
  - Divide two integers
  - Simplify expressions involving multiplication or division with integers
  - Evaluate variable expressions involving multiplication or division with integers (20)
- Multiplying and Dividing Integers in Applications
  - Translate word phrases involving multiplication or division to algebraic expressions (20)

3.5 Solve Equations Using Integers and the Division Property of Equality

- The Subtraction and Addition Properties of Equality with Integers
  - Determine whether an integer is a solution of an equation (20)
  - Solve equations with integers using the addition and subtraction properties of equality
- The Division Property of Equality
  - Model the Division Property of Equality

    - Solve equations using the Division Property of Equality (20)
- Translating Phrases to Algebraic Equations with Integers and Solving
    - Translate to an equation with integers and solve (20)

Chapter 4: Fractions

4.1 Visualize Fractions

- Introduction to Fractions, Improper Fractions, and Mixed Numbers
    - Understand the meaning of fractions
    - Model improper fractions and mixed numbers
    - Convert between improper fractions and mixed numbers (20, 20)
- Finding Equivalent Fractions
    - Model equivalent fractions
    - Find equivalent fractions (20)
- Ordering Fractions and Mixed Numbers
    - Locate fractions and mixed numbers on the number line
    - Order fractions and mixed numbers

4.2 Multiply and Divide Fractions

- Simplifying and Multiplying Fractions
    - Reduce a fraction to lowest terms
    - Multiply two fractions (20)
- Reciprocals and Dividing Fractions
    - Find reciprocals (20)
    - Divide two fractions (20)

4.3 Multiply and Divide Mixed Numbers and Complex Fractions

- Multiplying and Dividing Mixed Numbers
    - Multiply mixed numbers (20)
    - Divide mixed numbers (20)
- Simplifying Complex Fractions and Order of Operations with Fractions
    - Translate phrases to expressions with fractions
    - Simplify a complex fraction (20)
    - Simplify an expression written with a fraction bar

4.4 Add and Subtract Fractions with Common Denominators

- Adding and Subtracting Fractions with Common Denominators
    - Model fraction addition
    - Add fractions with a common denominator (20)
    - Model fraction subtraction
    - Subtract fractions with a common denominator (20)

4.5 Add and Subtract Fractions with Different Denominators

- Adding and Subtracting Fractions with Different Denominators
    - Find the least common denominator (LCD)
    - Convert fractions to equivalent fractions with the LCD (20)
    - Add and subtract fractions with different denominators
- Combining Fraction Operations
    - Identify and use fraction operations

        - Use the order of operations to simplify complex fractions
        - Evaluate a variable expression with fractions

4.6 Add and Subtract Mixed Numbers

- Adding and Subtracting Mixed Numbers with Common Denominators
    - Model addition of mixed numbers with a common denominator
    - Add mixed numbers with a common denominator (20)
    - Model subtraction of mixed numbers
    - Subtract mixed numbers with a common denominator (20)
- Adding and Subtracting Mixed Numbers with Different Denominators
    - Add and subtract mixed numbers with different denominators

4.7 Solve Equations with Fractions

- Solve Equations with Fractions Using the Addition, Subtraction, and Division Properties of Equality
    - Determine whether a fraction is a solution of an equation
    - Solve equations with fractions using the Addition, Subtraction, and Division Properties of Equality (20)
- Solve Equations with Fractions Using the Multiplication Properties of Equality
    - Solve equations using the Multiplication Property of Equality (20)
    - Solve equations with a fraction coefficient using the Multiplication Property of Equality (20)
    - Translate sentences involving fractions to equations and solve

Chapter 5: Decimals

5.1 Introduction to Decimals

- Naming Decimals and Converting Decimals to Fractions
    - Name decimals (20)
    - Write decimals (20)
    - Convert decimals to fractions or mixed numbers (20, 20)
- Ordering and Rounding Decimals
    - Locate decimals on the number line
    - Order decimals (20)
    - Round a decimal (20)

5.2 Decimal Operations

- Operations with Decimals
    - Add and subtract two decimals
    - Multiply two decimals (20)
    - Divide decimals by a whole number
    - Divide a decimal by another decimal (20)
- Operations with Decimals in a Money Application
    - Use decimals in money applications

5.3 Decimals and Fractions

- Converting Fractions to Decimals and Order of Operations with Decimals
    - Convert fractions to decimals (20)
    - Order decimals and fractions

        - Simplify expressions involving decimals using the order of operations
    - Circumference and Area of Circles
        - Find the circumference and area of circles with pi as a decimal approximation (20)
        - Find the circumference and area of circles with pi as a fractional approximation (20)

5.4 Solve Equations with Decimals

- Solving Equations Involving Decimals
    - Determine whether a decimal is a solution of an equation (20)
    - Solve equations with decimals (20)
    - Translate sentences involving decimals to an equation and solve

5.5 Averages and Probability

- Finding the Mean, Median, and Mode of a Set of Numbers
    - Calculate the mean of a set of numbers (20)
    - Find the median of a set of numbers (20)
    - Find the mode of a set of numbers (20)
- Calculating the Probability of an Event
    - Apply the basic definition of probability

5.6 Ratios and Rate

- Writing Ratios and Using Ratios in Applications
    - Write a ratio as a fraction (20)
    - Use ratios in applications
- Unit Rates and Unit Prices
    - Write a rate as a fraction
    - Find unit rates
    - Find unit price
    - Translate phrases to expressions as rates or ratios

5.7 Simplify and Use Square Roots

- Evaluating, Estimating, and Approximating Square Roots
    - Evaluate square root expressions (20)
    - Estimate square roots (20)
    - Approximate square roots (20)
- Simplifying Square Roots with Variables and Square Roots in Applications
    - Simplify a variable expression with square roots (20)
    - Use a square root in applications

Chapter 6: Percents

6.1 Understand Percent

- Definition of Percent and Converting Percents
    - Use the definition of percent
    - Convert percents to fractions (20)
    - Convert percents to decimals (20)
    - Convert decimals and fractions to percents (20, 20)

6.2 Solve General Applications of Percent

- Percent Equations and Percent Increase and Decrease

        - Translate and solve a basic percent equation (20, 20)
        - Solve applications of percent
        - Find percent increase and percent decrease

6.3 Solve Sales Tax, Commission, and Discount Applications

- Using Percents with Sales Tax, Commission, and Discount Applications
    - Solve sales tax applications
    - Solve commission applications
    - Solve discount applications
    - Solve mark-up applications

6.4 Solve Simple Interest Applications

- Solving Simple Interest Applications
    - Use the simple interest formula
    - Solve a simple interest application

6.5 Solve Proportions and Their Applications

- Proportions and Applications Using Proportions
    - Use the definition of proportion
    - Solve proportions (20)
    - Solve applications using proportions
- Writing and Solving Percent Proportions
    - Write percent equations as proportions
    - Translate and solve percent proportions

Chapter 7: The Properties of Real Numbers

7.1 Rational and Irrational Numbers

- Classifying Real Numbers
    - Identify rational numbers and irrational numbers (20)
    - Classify different types of real numbers

7.2 Commutative and Associative Properties

- Simplifying Expressions with the Commutative and Associative Properties
    - Use the commutative and associative properties
    - Evaluate expressions using the commutative and associative properties
    - Simplify expressions using the commutative and associative properties

7.3 Distributive Property

- Simplifying Expressions with the Distributive Property
    - Simplify expressions using the distributive property
    - Simplify expressions involving fractions or decimals with the distributive property (20)
    - Simplify expressions using the distributive property where a variable needs distributed (20)
    - Simplify expressions using the distributive property where a negative number needs distributed (20)
- Evaluating Expressions with the Distributive Property
    - Use the distributive property as a step in the order of operations
    - Evaluate expressions using the distributive property

7.4 Properties of Identity, Inverses, and Zero

- Use the Properties of Identity, Inverses, and Zero to Simplify Expressions
    - Recognize the identity properties of addition and multiplication
    - Use the inverse properties of addition and multiplication
    - Use the properties of zero
    - Simplify expressions using the properties of identities, inverses, and zero

7.5 Systems of Measurement

- Unit Conversions in the US System
    - Make a unit conversion in the US system
    - Use mixed units in the US System
- Unit Conversions in the Metric System
    - Make a unit conversion in the metric system
    - Use mixed units in the metric system
- Unit Conversions Between the US and Metric System
    - Convert between the US and the metric systems of measurement
    - Convert between Celsius and Fahrenheit temperatures

Chapter 8: Solving Linear Equations

8.1 Solve Equations Using the Subtraction and Addition Properties of Equality

- Simplifying and Solving Equations Using the Subtraction and Addition Properties of Equality
    - Solve equations using the Subtraction and Addition Properties of Equality
    - Solve equations that need to be simplified using the Subtraction and Addition Properties of Equality
    - Translate an equation and solve using the Subtraction and Addition Properties of Equality
- Translate and solve applications using the Subtraction and Addition Properties of Equality

8.2 Solve Equations Using the Division and Multiplication Properties of Equality

- Simplifying and Solving Equations Using the Division and Multiplication Properties of Equality
    - Solve equations using the Division and Multiplication Properties of Equality (20, 20)
    - Solve equations that need to be simplified using the Division and Multiplication Properties of Equality (20)

8.3 Solve Equations with Variables and Constants on Both Sides

- A General Strategy for Solving Equations
    - Solve equations with constants on both sides (20)
    - Solve an equation with variables on each side (20)
    - Solve an equation with variables and constants on both sides (20)
- General Strategies for Solving Linear Equations
    - Solve an equation using the distributive property with variables on one side (20)
    - Solve an equation using the distributive property with variables on both sides (20)
    - Classify equations as conditional, identity, or a contradiction

8.4 Solve Equations with Fraction or Decimal Coefficients

- Use a General Strategy for Solving Equations with Fractions
    - Solve equations with fraction coefficients (20)

        - Solve equations with fraction coefficients and the distributive property (20)
    - Use a General Strategy for Solving Equations with Decimals
        - Solve equations with decimal coefficients (20)
        - Solve equations with decimal coefficients and the distributive property (20)

8.5 Solve Linear Inequalities

- Inequalities, the Number Line, and Interval Notation
    - Graph an inequality on the number line
    - Express an inequality using interval notation (20)
- Solving One-Step Linear Inequalities
    - Solve an inequality using the subtraction and addition properties of inequality (20)
    - Solve an inequality using the division and multiplication properties of inequality (20)
- Solving Linear Inequalities
    - Solve an inequality that requires simplification
    - Classify an inequality as conditional, identity, or contradiction (20)
    - Translate an English sentence into an inequality and solve (20)

Chapter 9: Math Models and Geometry

9.1 Use a Problem Solving Strategy

- Introduction to Problem Solving and Number Problems
    - Use a problem solving strategy for word problems
    - Solve number problems (20)
    - Solve number problems involving multiple numbers (20)
    - Solve number problems involving consecutive integers (20)

9.2 Solve Money Applications

- Solve Problems Involving Coins, Tickets, or Stamps
    - Solve a coin word problem
    - Solve a ticket or stamp word problem

9.3 Use Properties of Angles, Triangles, and the Pythagorean Theorem

- Solve Problems with Angle Measures and Similar Triangles
    - Use the definitions of supplementary and complementary angles to solve problems
    - Find the measures of angles of a triangle using properties
    - Use the properties of similar triangles to solve problems
- Solve Problems with the Pythagorean Theorem
    - Use the Pythagorean Theorem to find the length of a missing side of a right triangle
    - Use the Pythagorean Theorem to solve application problems

9.4 Use Properties of Rectangles, Triangles, and Trapezoids

- Find the Area and Perimeter of Rectangles
    - Understand linear, square, and cubic measure and the definition of area and perimeter
    - Solve problems involving the area and perimeter of rectangles
    - Use the area or perimeter of a rectangle to find the length or width of a rectangle when when one side is given in terms of another
- Find the Area and Perimeter of Triangles
    - Solve problems involving the area and perimeter of triangles
    - Solve problems involving the area and perimeter of isosceles or equilateral triangles

9.5 Solve Geometry Applications with Circles and Irregular Figures
- Find the Area of Trapezoids
    - Use properties of trapezoids
- Area and Circumference of Circles and Area of Irregular Figures
    - Solve problems involving the area and circumference of circles
    - Find the area of irregular figures made from rectangles and triangles
    - Find the area of irregular figures made from circles and other shapes

9.6 Solve Geometry Applications with Volume and Surface Area
- Volume and Surface Area of Rectangular Solids and Spheres
    - Find volume and surface area of rectangular solids and cubes
    - Find volume and surface area of spheres
- Volume and Surface Area of Cylinders and Cones
    - Find volume and surface area of cylinders
    - Find volume of cones

9.7 Solve a Formula for a Specific Variable
- The Distance, Rate, and Time Formula and Solving for a Specific Variable
    - Use the distance, time, and rate formula
    - Solve a given formula for a specific variable
    - Solve a formula for y (20)

9.8 Solve Applications with Linear Inequalities
- Problem Solving with Linear Inequalities
    - Solve one-step applications with linear inequalities
    - Solve applications with linear inequalities

Chapter 10: Graphs and an Introduction to Functions

10.1 Use the Rectangular Coordinate System
- Reading Graphs and the Rectangular Coordinate System
    - Plot points on a rectangular coordinate system
    - Verify the solution to an equation in two variables (20)
    - Complete a table of solutions to a linear equation in two variables
    - Find solutions to a linear equation (20)

10.2 Graph Linear Equations in Two Variables
- Graphing Linear Equations
    - Recognize the relationship between the solutions of an equation and its graph
    - Graph a linear equation by plotting points
    - Graph a linear equation in standard form by plotting points (20)
    - Graph vertical and horizontal lines

10.3 Graph with Intercepts
- Intercepts on the Coordinate Plane
    - Identify the x- and y-intercepts on a graph
    - Find the x- and y-intercepts from an equation of a line (20)
    - Graph a line using the x- and y-intercepts

10.4 Understand Slope of a Line
- Understanding Slope

        - Use a geoboard to model slope
        - Use the relationship between rise and run to find the slope of a line from its graph
        - Find the slope of horizontal and vertical lines (20)
    - The Slope Formula
        - Use the slope formula to find the slope of a line between two points (20)
        - Graph a line given a point and the slope
        - Determine the slope in applications (20)

10.5 Use the Slope-Intercept Form of an Equation of a Line

- Slope-Intercept Form
    - Identify the slope and y-intercept from an equation of a line and relate a graph to the equation
    - Graph a line given its equation using its slope and y-intercept
    - Graph lines using a variety of methods
    - Graph and interpret applications of slope-intercept
- Parallel and Perpendicular Lines
    - Use slopes to identify parallel lines (20)
    - Use slopes to identify perpendicular lines (20)

10.6 Find the Equation of a Line

- Equations of Lines
    - Find an equation of the line given the slope and y-intercept (20)
    - Find an equation of the line given the slope and a point (20)
    - Find an equation of the line given two points (20)
- Equations of Parallel and Perpendicular Lines
    - Find an equation of a line parallel to a given line (20)
    - Find an equation of a line perpendicular to a given line (20)

10.7 Graphs of Linear Inequalities

- Graphing Linear Inequalities
    - Verify solutions to an inequality in two variables (20)
    - Recognize the relationship between the solutions of an inequality and its graph
    - Graph a linear inequality

10.8 Relations and Functions

- Introduction to Functions
    - Find the domain and range of a relation (20)
    - Determine if a relation is a function given a set of ordered pairs or a mapping (20)
    - Determine if a relation is a function given an equation (20)
- Function Notation
    - Use function notation to find the value of a function given a number (20)
    - Use function notation to find the value of a function given a variable expression (20)

10.9 Graphs of Functions

- The Vertical Line Test and Graphs of Functions
    - Use the vertical line test to determine if a graph represents a function
    - Identify graphs of basic functions
    - Read information from the graph of a function

Knewton Alta

Chapter 11: Systems of Linear Equations

11.1 Solve Systems of Equations by Graphing

- Solving Systems of Linear Equations by Graphing
    - Determine whether an ordered pair is a solution of a system of linear equations (20)
    - Solve a system of linear equations by graphing
    - Determine the number of solutions of a linear system (20)
    - Solve applications of systems of linear equations by graphing

11.2 Solve Systems of Equations by Substitution

- Solving Systems of Linear Equations by Substitution
    - Solve a system of linear equations by substitution
    - Solve applications of systems of linear equations by substitution (20)

11.3 Solve Systems of Equations by Elimination

- Solving Systems of Linear Equations by Elimination
    - Solve a system of linear equations by elimination
    - Solve applications of systems of equations by elimination (20)
    - Solve a system of linear equations using a variety of methods (20)

11.4 Solve Applications with Systems of Equations

- Systems of Linear Equations and Problem Solving
    - Translate a word problem to a system of equations
    - Solve a word problem using a system of equations
    - Solve an application in geometry using a system of equations
    - Solve uniform motion applications using a system of equations

11.5 Solve Mixture Applications with Systems of Equations

- Mixture Problems and Systems of Equations
    - Solve mixture applications involving tickets or money with a system of equations
    - Solve mixture applications involving concentrations using a system of equations
    - Solve interest applications using a system of equations

11.6 Solve Systems of Equations with Three Variables

- Solving Systems of Linear Equations in Three Variables
    - Determine whether an ordered triple is a solution of a system of three linear equations with three variables (20)
    - Solve a system of linear equations with three variables (20)
    - Identify inconsistent and dependent systems of equations with three variables (20)
    - Solve applications using systems of linear equations in three variables

11.7 Solve Systems of Equations Using Matrices

- Solving Systems of Linear Equations with Matrix Row Operations
    - Write the augmented matrix for a system of equations
    - Use row operations on a matrix (20)
    - Solve a system of equations using matrices (20)

11.8 Solve Systems of Equations Using Determinants

- Determinants of Matrices
    - Evaluate the determinant of a 2x2 matrix (20)
    - Evaluate the minor of an element in a 3x3 matrix (20)
    - Evaluate the determinant of a 3x3 matrix (20)

- Solving Systems of Linear Equations with Cramer's Rule and Determinants
    - Use Cramer's Rule to solve systems of equations in two variables (20)
    - Use Cramer's Rule to solve systems of equations in three variables (20)
    - Use determinants to determine if three given points are collinear (20)

Chapter 12: Compound and Absolute Value Inequalities and Systems of Linear Inequalities

12.1 Solve Compound Inequalities

- Solving Compound Inequalities
    - Solve a compound inequality involving intersections
    - Solve a compound inequality involving unions
    - Solve applications with compound inequalities (20)

12.2 Solve Absolute Value Equations and Inequalities

- Solving Absolute Value Equations and Inequalities
    - Solve an absolute value equation (20)
    - Solve an absolute value inequality involving "less than" (40)
    - Solve an absolute value inequality involving "greater than"
    - Solve applications with absolute value (40)

12.3 Graphing Systems of Linear Inequalities

- Solving Systems of Linear Inequalities
    - Determine whether an ordered pair is a solution of a system of linear inequalities (20)
    - Solve a system of linear inequalities by graphing
    - Solve applications of systems of linear inequalities

Chapter 13: Polynomials

13.1 Add and Subtract Polynomials

- Adding and Subtracting Polynomials
    - Identify the types and degrees of polynomials (20, 20)
    - Add and subtract monomials (20)
    - Add and subtract polynomials (20)
    - Evaluate a polynomial for a given value (20)

13.2 Use Multiplication Properties of Exponents

- Product Properties of Exponents
    - Simplify numerical expressions containing exponents (20)
    - Simplify expressions using the product property for exponents (20)
    - Simplify expressions using the power property for exponents or the product to a power property for exponents (20)
    - Simplify expressions by applying several properties

13.3 Multiply Polynomials

- Multiplying Polynomials
    - Multiply monomials (20)
    - Multiply a polynomial by a monomial
    - Multiply a binomial by a binomial (20)
    - Multiply a trinomial by a binomial (20)

13.4 Special Products

- Special Products of Binomials
    - Square a binomial using the binomial squares pattern (20)
    - Multiply conjugates using the product of conjugates pattern (20)
    - Recognize and use the appropriate special product pattern

13.5 Divide Monomials

- Quotient Properties of Exponents and Dividing Monomials
    - Simplify expressions using the quotient property for exponents and the exponent of zero (20)
    - Simplify expressions using the quotient to a power property (20)
    - Simplify expressions by applying several quotient properties of exponents
    - Divide monomials (20)

13.6 Divide Polynomials

- Dividing Polynomials
    - Divide a polynomial by a monomial (20)
    - Divide a polynomial by a binomial using polynomial long division (20)
- Synthetic Division and the Remainder and Factor Theorems
    - Use synthetic division to divide polynomials (20)
    - Use the remainder and factor theorems (20, 20)

13.7 Integer Exponents and Scientific Notation

- Negative Exponents
    - Use the definition of a negative exponent (20)
    - Simplify expressions with integer exponents (20)
- Scientific Notation
    - Convert from decimal notation to scientific notation (20)
    - Convert from scientific notation to decimal notation (20)
    - Multiply and divide using scientific notation (20, 20)

Chapter 14: Factoring

14.1 Greatest Common Factor and Factor by Grouping

- The Greatest Common Factor and Factoring by Grouping
    - Find the greatest common factor of two or more expressions (20)
    - Factor the greatest common factor from a polynomial (20)
    - Factor a polynomial by grouping (20)

14.2 Factor Quadratic Trinomials with Leading Coefficient 1

- Factoring Trinomials with a Leading Coefficient of 1
    - Factor a trinomial of the form x^2+bx+c where c is positive (20)
    - Factor a trinomial of the form x^2+bx+c where c is negative (20)
    - Factor a trinomial of the form x^2+bxy+cy^2 (20)

14.3 Factor Quadratic Trinomials with Leading Coefficient Other than 1

- Factoring Trinomials with a Leading Coefficient Other than 1
    - Factor a trinomial of the form ax^2+bx+c with a GCF (20)
    - Factor a trinomial using trial and error
    - Factor a trinomial using the 'ac' method (20)

14.4 Factor Special Products

- Factoring Special Products
    - Factor a perfect square trinomial (20)
    - Factor a difference of squares (20)
    - Factor polynomials by combining the difference of squares and perfect square trinomial patterns
    - Factor sums and differences of cubes (20, 20)

14.5 General Strategy for Factoring Polynomials

- Choosing a Factoring Strategy
    - Recognize and use the appropriate method to factor a polynomial completely

14.6 Quadratic Equations

- Solving Quadratic Equations by Factoring
    - Solve a factored quadratic equation using the zero product property (20)
    - Solve a quadratic equation by factoring (20)
    - Solve applications modeled by quadratic equations

14.7 Polynomial Equations

- Solving Polynomial Equations by Factoring
    - Use the zero product property to solve a factored polynomial equation (20)
    - Solve polynomial equations by factoring (20, 17)
    - Find zeros and intercepts of a polynomial function by factoring (40)
    - Use factoring to solve application problems involving polynomial equations (40)

Chapter 15: Rational Expressions and Equations

15.1 Simplify Rational Expressions

- Domain of Rational Expressions and Simplifying Rational Expressions
    - Determine the values for which a rational expression is undefined (20)
    - Evaluate a rational expression (20)
    - Simplify a rational expression (20)
    - Simplify a rational expression with opposite factors (20)

15.2 Multiply and Divide Rational Expressions

- Multiplying and Dividing Rational Expressions
    - Multiply rational expressions (20)
    - Divide rational expressions (20)
    - Multiply and divide more than two rational expressions (20)

15.3 Add and Subtract Rational Expressions with a Common Denominator

- Adding and Subtracting Rational Expressions with a Common Denominator
    - Add rational expressions with a common denominator (20)
    - Subtract rational expressions with a common denominator (20)
    - Add and subtract rational expressions whose denominators are opposites (20)

15.4 Add and Subtract Rational Expressions with Unlike Denominators

- Adding and Subtracting Rational Expressions with Unlike Denominators
    - Find the least common denominator of rational expressions (20)
    - Find equivalent rational expressions (20)
    - Add rational expressions with different denominators (20)
    - Subtract rational expressions with different denominators (20)

15.5 Simplify Complex Rational Expressions
- Simplifying Complex Fractions
    - Simplify a complex rational expression by writing it as division (20)
    - Simplify a complex rational expression by using the LCD

15.6 Solve Rational Equations
- Solving Rational Equations
    - Solve a rational equation that results in a linear equation
    - Solve a rational equation that results in a quadratic equation
    - Solve a rational equation for a specific variable

15.7 Solve Proportion and Similar Figure Applications
- Proportions and Problem Solving with Rational Equations
    - Solve proportions (20)
    - Solve applications with proportions
    - Solve similar figure applications

15.8 Solve Uniform Motion and Work Applications
- Uniform Motion, Work, and Problem Solving
    - Solve uniform motion applications involving rational equations
    - Solve problems involving rates of work using rational equations

15.9 Use Direct and Inverse Variation
- Variation and Problem Solving
    - Solve direct variation problems
    - Solve inverse variation problems

15.10 Solve Rational Inequalities
- Solving Rational Inequalities
    - Find the solution set of a rational inequality
    - Solve an inequality with rational functions (40)

Chapter 16: Roots and Radicals

16.1 Simplify and Use Square Roots
- Understanding Square Roots
    - Simplify expressions with square roots (20)
    - Estimate square roots and approximate square roots (20, 20)
    - Simplify variable expressions with square roots (20)

16.2 Simplify Square Roots
- Simplifying Square Root Expressions
    - Use the product property to simplify square roots
    - Use the quotient property to simplify a perfect square fraction (20)
    - Use the quotient property to simplify square roots

16.3 Add and Subtract Square Roots
- Adding and Subtracting Square Root Expressions
    - Add and subtract like square roots (20)
    - Add and subtract square roots that need simplification (20)

16.4 Multiply Square Roots
- Multiplying Square Root Expressions

- Multiply square roots (20)
- Use polynomial multiplication to multiply square roots (20)
- Use special product formulas to multiply square roots (20)

16.5 Divide Square Roots

- Dividing Square Root Expressions and Rationalizing Denominators
  - Divide square roots (20)
  - Rationalize a one-term denominator (20)
  - Rationalize a two-term denominator (20)

16.6 Solve Equations with Square Roots

- Solving Radical Equations
  - Solve a square root equation with a single radical (20)
  - Solve a square root equation with two radicals (20)
  - Use square roots in applications

16.7 Higher Roots

- Understanding Higher Roots
  - Simplify numerical expressions with higher roots
  - Simplify expressions with higher roots (20)
- Simplifying Higher Roots and Operations on Higher Roots
  - Use the product property to simplify expressions with higher roots
  - Use the quotient property to simplify expressions with higher roots
  - Add and subtract higher roots (20)

16.8 Rational Exponents

- Simplifying Expressions with Rational Exponents
  - Simplify expressions with rational exponents and a numerator of 1 (20)
  - Simplify expressions with rational exponents and a numerator greater than 1 (20)
  - Use the laws of exponents to simplify expressions with rational exponents

16.9 Use Radicals in Functions

- Radical Functions
  - Evaluate a radical function (20)
  - Find the domain of a radical function
  - Graph a radical function by plotting points and determine its range

16.10 Use the Complex Number System

- Introduction to Complex Numbers
  - Evaluate the square root of a negative number and understand the complex number system (20)
  - Add or subtract complex numbers (20)
- Multiplying and Dividing Complex Numbers and Powers of i
  - Multiply complex numbers (20)
  - Multiply two complex conjugates (20)
  - Divide complex numbers (20)
  - Simplify powers of i (20)

Chapter 17: Quadratic Equations

17.1 Solve Quadratic Equations Using the Square Root Property

- Solving Quadratic Equations Using the Square Root Property
    - Solve a quadratic equation using the square root property (20)
    - Solve a quadratic equation with a binomial as the quadratic term using the square root property
    - Solve a quadratic equation where factoring results in a perfect square binomial

17.2 Solve Quadratic Equations by Completing the Square

- Solving Quadratic Equations by Completing the Square
    - Complete the square of a binomial expression (20)
    - Solve a quadratic equation with a leading coefficient of 1 by completing the square (20)
    - Solve a quadratic equation with a leading coefficient greater than 1 by completing the square (20)

17.3 Solve Quadratic Equations Using the Quadratic Formula

- Solving Quadratic Equations with the Quadratic Formula
    - Solve a quadratic equation using the quadratic formula with 2 real solutions (20)
    - Solve a quadratic equation using the quadratic formula with 1 or 0 real solutions (20)
    - Use the discriminant to predict the number of solutions of a quadratic equation (20)

17.4 Solve Quadratic Equations in Quadratic Form

- Solving Equations by Using Quadratic Methods
    - Solve an equation in quadratic form by using substitution (40)
    - Solve an equation in quadratic form with rational or negative exponents by using substitution (40)

17.5 Solve Applications Modeled by Quadratic Equations

- Problem Solving with Quadratic Equations
    - Solve applications modeled by quadratic equations that may require the quadratic formula
    - Solve geometric applications that may require the quadratic formula

17.6 Graph Quadratic Functions Using Properties

- Parabolas and Their Properties
    - Graph a quadratic function by plotting points and determine the direction a parabola opens
    - Determine the axis of symmetry and vertex of a parabola given a function (20)
    - Determine the intercepts of a parabola given a function (20)
- Graphing Quadratic Functions
    - Graph a quadratic function by finding key points
    - Determine the minimum or maximum of a quadratic function and use it in applications (40)

17.7 Graph Quadratic Functions Using Transformations

- Transformations of Parabolas
    - Graph a quadratic function using a vertical translation
    - Graph a quadratic function using a horizontal translation
    - Graph a quadratic function by compression, stretching, or reflecting
- Graphing Quadratic Functions Using Transformations
    - Rewrite a quadratic in vertex form and graph it using transformations
    - Find a quadratic function given its graph

17.8 Solve Quadratic Inequalities

- Solving Quadratic Inequalities
    - Solve a quadratic inequality graphically
    - Solve a quadratic inequality algebraically (40)

Chapter 18: Exponential and Logarithmic Functions

18.1 Finding Composite and Inverse Functions

- Composite Functions
    - Perform a composition of functions (20)
    - Evaluate a composition of functions for a specific value (20)
- One-to-One Functions
    - Determine whether a function is one-to-one given a set of ordered pairs
    - Use the horizontal line test to determine whether a graph represents a one-to-one function
- Inverse Functions
    - Find the inverse of a function given a set of ordered pairs or a graph (40)
    - Verify that two functions are inverses of each other (40)
    - Find the inverse of a function algebraically (40)

18.2 Evaluate and Graph Exponential Functions

- Graphing Exponential Functions
    - Graph an exponential function and understand its properties
    - Graph an exponential function using transformations
    - Evaluate an exponential function with base e and understand the natural base (40)
- Applications with Exponential Functions
    - Use the one-to-one property of exponential equations to solve an exponential equation (40)
    - Use the compound interest formula to find the new value of an account (40)
    - Use the continuously compounding interest formula to find the new value of an account (40)
    - Calculate resultant values using exponential growth and decay models (40)

18.3 Evaluate and Graph Logarithmic Functions

- Introduction to Logarithms
    - Convert between exponential and logarithmic form (20, 20)
    - Evaluate a logarithmic function (20)
- Logarithmic Functions and Applications
    - Graph a logarithmic function and understand its properties
    - Solve a logarithmic equation by rewriting the equation in exponential form (20)
    - Use logarithmic models in applications (40)

18.4 Use the Properties of Logarithms

- Understanding the Properties of Logarithms
    - Use basic properties of logarithms and the inverse properties of logarithms (40)
    - Use the product, quotient, and power properties of logarithms (40)
- Using the Properties of Logarithms
    - Use the properties of logarithms to expand a logarithmic expression (40)
    - Use the properties of logarithms to condense a logarithmic expression (40)

- Use the change-of-base formula for logarithms (20)

18.5 Solve Exponential and Logarithmic Equations

- Solving Logarithmic Equations
  - Use the one-to-one property of logarithmic equations to solve logarithmic equations (40)
  - Use the properties of logarithms to solve logarithmic equations (40)
- Solving Exponential Equations and Applications
  - Solve exponential equations using logarithms (40)
  - Solve for amounts other than a new balance with the compound or continuously compounding interest formula (40)
  - Use the exponential growth and decay models to find values other than the resultant value (40)

Chapter 19: Conics

19.1 Distance and Midpoint Formulas and Circles

- The Distance and Midpoint Formulas
  - Use the distance formula to find the distance between two points (20)
  - Use the midpoint formula to find the midpoint between two points
- The Equation of Circles
  - Write the standard form of the equation of a circle given its center and radius (20)
  - Write the standard form of the equation of a circle given its center and a point on the circle (20)
  - Graph a circle given its equation in standard form
  - Rewrite the equation of a circle given in general form by completing the square

19.2 Parabolas

- Parabolas as Conic Sections and Applications
  - Graph a vertical parabola given the equation in general or standard form
  - Graph a horizontal parabola given the equation in general form
  - Graph a horizontal parabola given the equation in standard form
  - Solve applications with parabolas

19.3 Ellipses

- Ellipses with Centers at the Origin
  - Graph an ellipse with its center at the origin
  - Find the equation of an ellipse with its center at the origin
- Ellipses with Centers Not at the Origin and Applications
  - Graph an ellipse with its center not at the origin
  - Rewrite the equation of an ellipse given in general form by completing the square
  - Solve applications with ellipses

19.4 Hyperbolas

- Hyperbolas as Conic Sections
  - Graph a hyperbola with its center at the origin
  - Graph a hyperbola with its center not at the origin
  - Rewrite the equation of a hyperbola given in general form by completing the square
- Identifying Conic Sections by Their Equations
  - Identify conic sections by their equations

19.5 Solve Systems of Nonlinear Equations

- Solving Systems of Nonlinear Equations
  - Solve a system of nonlinear equations by graphing
  - Solve a system of nonlinear equations using substitution (40)
  - Solve a system of nonlinear equations using elimination (40)
- Problem Solving with Systems of Nonlinear Equations
  - Use a system of nonlinear equations to solve applications (40)

Chapter 20: Sequences, Series, and the Binomial Theorem

20.1 Sequences

- Introduction to Sequences
  - Write the first few terms of a sequence (20)
  - Find a formula for the general term of a sequence (20)
- Factorial Notation and Sigma Notation
  - Use factorial notation (20)
  - Find the partial sum (20)
  - Use summation notation to write a sum (20)

20.2 Arithmetic Sequences and Series

- Arithmetic Sequences and Series
  - Determine if a sequence is arithmetic and write the first few terms of an arithmetic sequence (20)
  - Find the general term of an arithmetic sequence (20)
  - Find the sum of the first n terms of an arithmetic sequence (20)

20.3 Geometric Sequences and Series

- Geometric Sequences
  - Determine if a sequence is geometric and write the first few terms of a geometric sequence (20)
  - Find the general term of a geometric sequence (20)
- Finite and Infinite Geometric Series and Applications
  - Find the sum of the first n terms of a geometric sequence (20)
  - Find the sum of an infinite geometric series and use infinite geometric series to write a repeating decimal as a fraction (20, 20)
  - Use geometric sequences and series to solve monetary applications including annuities (40)

20.4 Binomial Theorem

- The Binomial Theorem
  - Use Pascal's Triangle to expand a binomial (20)
  - Evaluate a binomial coefficient (20)
  - Use the binomial theorem to expand a binomial (20)